NavMed 369

UNITED STATES NAVY

MEDICAL NEWS LETTER

Rear Admiral Bartholomew W. Hogan MC USN - Surgeon General
Captain Leslie B. Marshall MC USN (RET) - Editor

Vol. 31 Friday, 4 April 1958 No. 7

TABLE OF CONTENTS

HISTORICAL FUND
of the
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donatioms must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

Treasurer, N. M. D. Historical Fund
Bureau of Medicine and Surgery (Code 14)
Department of the Navy
Washington 25, D. C.

Committee

F. P. GILMORE, Rear Admiral (MC) USN, Chairman
R. W. MALONE, Rear Admiral (DC) USN
W. C. CALKINS, Captain (MSC) USN
W. L. JACKSON, Captain (NC) USN
T. J. HICKEY, Secretary-Treasurer

Blood Pressure in White People Over Sixty-Five

Little has hitherto been known concerning the range of the blood pressure in "healthy" older people. Analysis of studies previously made has revealed that the conclusions had been based neither on an adequate number nor on a representative sampling of subjects. The findings frequently were not subdivided according to detailed age groups. The presence or absence of cardiovascular disease had often not been considered. Nor had any systematic effort formerly been made to determine the blood pressure in those who were 90 years of age or older.

Recent statistics have emphasized the importance of investigating the medical problems which beset the aged. The Bureau of Census reported that in 1955 more than 14,000,000 Americans were 65 years of age or older. The prediction has been made that at least 20,500,000 will be more than 65 years old in 1975. The broader aspect of aging becomes quite evident when it is realized that there are now more than 60,000,000 people over 40 years of age in this country. The trend has been generally toward an increased life expectancy. It has been estimated that more than 70% of males who reach the age of 40, and more than 80% of females will live to be at least 65.

The blood pressure in old age has long been a problem, but is assuming even greater importance because of the ever increasing number of the aged. Questions involving prophylactic care, diagnosis, treatment, and insurability constantly arise. Is there a definite normal range of blood pressure among healthy individuals who are 65 years or older? Does the blood pressure continue to rise with advancing years as it does from birth to 65? Does the blood pressure continue to be higher among women over 65 than among men? Does an increase in the blood pressure after 64 result in a rise in the mortality rate as before 65? What is the definition of hypertension in the aged? Is 100-plus-the-age a good rule for determining their normal systolic pressure? Is 113 plus one-third the age a still better one? Or is 125 plus the age best? Does hypertension in the old produce cardiac enlargement as it does in younger adults? Does it predispose to angina pectoris and acute coronary insufficiency? Is the blood pressure in the aged affected by, or related to, their build and weight? Do geographic location, rural or urban living, ethnic origin, ability to work, and chronic illness significantly affect the blood pressure of the old? What is the blood pressure in healthy nonagenarians? Do the very old who are active, alert, and productive have unique blood pressures? Should antihypertensive drugs be employed when the pressure reaches a fixed height?

The present study attempts to find a solution to some of the many questions and problems which old age raises. Others will be considered in future publications and, hopefully, solved. Still others will demand much further study and research.

In an attempt to accumulate sufficient data on persons 65 or over, homes for the aged were at first approached as were large industrial concerns.

It was soon found that reliable data on sufficiently large numbers of healthy subjects could not be obtained from these sources. The aid of physicians throughout the country was, therefore, solicited. Their wholehearted help is hereby gratefully acknowledged. Contact was attempted with that number of physicians in each state which was in direct proportion to the number of its aged inhabitants and specially planned questionnaires were sent to them. Fifteen thousand were obviously carefully completed and returned by approximately 5000 physicians. Many physicians added pertinent remarks, many others furnished additional data, and some corresponded often with the authors.

The physicians were asked to choose as subjects for the study those patients, friends, or relatives 65 years of age or older who were apparently healthy in that they were ambulatory, were living in the community, and were able to take complete care of themselves. Those who suffered from certain chronic diseases—e.g., arthritis, cholecystitis, peptic ulcer, uncomplicated diabetes mellitus—were accepted as subjects, but those with cardiovascular disease were excluded. Inmates in homes for the aged were likewise excluded because the proportion of sick persons among them is higher than among the generality of old people.

Of the 15,000 older subjects who had been examined by physicians throughout America, 5757 were considered by the authors to be apparently healthy, as defined above, and form the basis of this report. Of these, 2998 were men and 2759 were women. The blood pressure readings were first analyzed for internal homogeneity because they came mainly from six different sources: (1) individual general practitioners, (2) members of the American College of Physicians, (3) members of the American Heart Association, (4) physicians employed in various Union Health Centers; (5) members of the American College of Chest Physicians, and (6) physicians on the staff of the Veterans Administration. The mean blood pressure and standard deviation found in the subjects from each of these sources were separately calculated and compared. They were found to be remarkably similar and, therefore, the blood pressure readings of all sources were combined for analysis.

From the data thus accumulated, arithmetical means, standard deviations and median and modal values were obtained for each sex in each 5-year age group of subjects. Subjects who were 95 years of age or older were considered in one age group. The statistical reliability of the differences between mean values was calculated from a computation of the standard error of the respective means. Frequency distribution graphs for systolic and diastolic pressure were then made by sex for each 5-year age group. It was noted that physicians tend to record blood pressure readings at the nearest zero figure (130-140-150). This resulted in peaks at readings whose terminal digit was zero instead of smooth curves of values between the extremes of the distribution curve. This was observed first by Janeway

and has been found in other large surveys. To minimize this artefact, 10 mm. Hg class intervals were adopted in the center of which were placed the blood pressure readings ending in zero. Thus, the systolic class intervals ranged from 85-94 up to 245-254, and the diastolic intervals from 45-54 up to 125-134. All readings below 85 mm. Hg systolic and below 45 mm. Hg diastolic were placed in a single class interval. The frequency was expressed as a percentage.

This study reveals an important difference in the behavior of the blood pressure of apparently healthy older and younger persons. The vast majority of investigators have found that blood pressure rises continuously from birth until the 60-65 years. The present investigation indicates that the systolic pressure does not continue to rise with age after the 75th year, or the diastolic after the 70th.

The frequency distribution curves of the blood pressure show that the factor of lability of pressure was not a source of error in the large group. When the number of subjects is large enough, and when the blood pressure is taken with reasonable care, the lability of the arterial pressure hardly influences the results.

After the age of 65, the blood pressure does not show a consistent rise with advancing years, as it does below the age of 65. The mean systolic pressure in both sexes continues to rise slightly until the 70-74 years, when the highest level of the mean systolic pressure is reached (159 mm. Hg among women). After the age of 74, the systolic pressure in women declines slowly for 10 years; it falls more definitely after the age of 85, reaching the lowest level in the 95-year group (149 mm. Hg). The average systolic pressure in men remains essentially constant—145 mm. Hg after the 70-74 years. The sex difference is greatest in the 70-74 year group when the systolic pressure in women is 14 mm. Hg higher than it is in men. The lowest sex difference (5 mm. Hg) is found after the age of 95. Thus, the systolic pressures of both sexes approach each other in extreme old age, but always remain slightly higher in the female.

The diastolic blood pressure is practically constant after the age of 65 in both sexes with minor exceptions; it is highest in the 65-69 year group, and is very slightly higher in women: in men, the mean is 83 mm. Hg, in women, 85. After the age of 69, the diastolic pressure declines slightly, but continuously, falling to 78 mm. Hg in men, and to 81 in women after the 95th year. This difference of 2 to 3 mm. Hg is not of practical significance.

The mean blood pressure for all subjects in this series, 65 to 106 years of age, was found to be 145/82 mm. Hg in men and 156/84 mm. Hg in women. The "modal" blood pressure (the peak or highest frequency of any pressure) was 140/80 mm. Hg in both sexes. The pulse pressure is larger in women than in men at all ages: 63 mm. Hg among all males, 72 mm. Hg among all females.

Two ranges of blood pressure have been computed for each sex between the 65th and 106th years. The middle 80% range in males is 115-175/70-95, and in females is 120-192/65-102. In general, if blood pressures fall within these limits and are not associated with evidence of hypertensive heart disease, antihypertensive drug therapy is not indicated. The middle 95% range in males is 100-190/62-102, and in females is 100-212/55-112. A blood pressure reading beyond these figures is practically always abnormal. The ranges suggested should be used only as clinical guides. The final evaluation of each blood pressure reading depends on the entire clinical picture. This is particularly true for blood pressures falling near or beyond the upper limit of the middle 80% range. (Master, A. M., Lasser, R. P., Jaffe, H. L., Blood Pressure in White People Over 65 Years of Age: Ann. Int. Med., 48: 284-296, February 1958)

* * * * * *

Problems in Management of Infective Endocarditis

With the introduction of antibiotics, management of bacterial endocarditis changed dramatically from that of symptomatic control prior to inevitable death to that of optimistic therapy for cure. Despite tremendous advances in antimicrobials, management of endocarditis results often in a long, costly, and all-too-frequently fatal course. At best, the average cure rate in sizable series appears at this time to be about 75%.

The experiences noted in a large teaching hospital are heavily weighted with the severe and complicated cases of this disease. The cases that occur after major cardiac or valvular surgery are included as well as the diagnostic problems in the series.

There are four major reasons for failure in the management of bacterial endocarditis: (1) lack of early recognition; (2) inadequate therapy; (3) failure of known antimicrobials to eradicate the infecting organism; and (4) complications due to the progression of the disease (rupture of the cusps of the aortic valve, cardiac failure, focal glomerulonephritis, and emboli). These reasons are considered separately in this article.

The history of unexplained and recurrent fever in a patient with valvular heart disease accompanied frequently by a mild anemia should immediately arouse the suspicion of bacterial endocarditis. Fatigue, weight loss, sweating and chills, with minimal or intermittent fever are to be regarded critically in these patients.

These symptoms may be found after a recent upper respiratory infection, following dental or oral-pharyngeal surgical procedures, after transurethral or other operative procedures in the pelvic area, and recently after extensive cardiac surgery. Other symptoms and signs, such as painful areas in the fingers, subungual splinter hemorrhages, petechiae,

and conjunctival, retinal, or mucus membrane hemorrhages are occasionally found. Clubbing of the fingers, palpable spleen or arterial emboli are other important signs. In the author's experience—as with others—the triad of fever, heart murmur and anemia should be adequate basis for the initiation of bacteriologic studies for the etiologic agent.

A positive diagnosis of bacterial endocarditis depends on the demonstration of a bacteremia. The question of what constitutes an adequate bacteriologic search has concerned all intimately associated with the problem. Generally, the routine of taking three blood cultures in a day has sufficed to establish a bacteriologic diagnosis.

A second major cause for failure lies in an inadequate antimicrobial regimen. The therapeutic program depends on the bacterial isolate obtained and upon the sensitivity of the organism to antibiotics. If an alpha streptococcus is isolated, penicillin is the keystone of treatment. Sensitivity tests as performed by the tube-dilution technique may be used as a guide for optimal dosage.

Results in the control of bacterial endocarditis support the thesis that cures are rarely, if ever, obtained without the use of bactericidal drugs. The choice of agents for acute bacterial endocarditis caused by organisms other than the Streptococcus viridans sometimes poses a considerable problem. Although other streptococci and pneumococci are encountered, these respond well to penicillin in most instances. With the Micrococci pyogenes (staphylococci), it has generally been necessary to employ combinations of antibiotics, such as penicillin with streptomycin, with chloramphenicol, or with erythromycin or novobiocin. It is by no means clear that such combinations offer any other advantage than the possible delay of emergence of resistant organisms. The combinations are occasionally effective in a moderately resistant Streptococcus viridans infection. Even these combinations have been disappointing in staphylococcal endocarditis, and bacitracin has been a sheet anchor in the stormy course of these infections. However, because of its renal toxicity, bacitracin therapy should be undertaken only with due regard for this problem and with use of laboratory studies on urine and blood to detect evidence of tubular toxicity. Doses of 30,000 units intramuscularly every 8 hours have been tolerated quite well for 3 to 4 weeks, with completely reversible renal toxic manifestations.

Recently, the successful use of Ristocetin in staphylococcal and enterococcal endocarditis has been reported. This agent requires intravenous administration.

With Gram-negative bacterial isolates, the choice of antibiotics is governed by sensitivity tests. The use of streptomycin as a bactericidal agent alone or in a combination with a broad-spectrum antibiotic is more likely to result in success than use of a broad-spectrum drug alone, provided there is some susceptibility of the organism to streptomycin. Among the Gram-negative isolates, Pseudomonas aeruginosa presents a special

problem because this organism is rarely susceptible to antibiotics other than neomycin and polymyxin. Both agents carry considerable toxic hazard if adequate therapy is to be maintained for the required time.

The duration of therapy provides another problem in management. Each case should be judged individually because no single pattern of therapy will be adequate for all organisms and acceptable for all patients.

Although the therapeutic armamentarium includes at least ten different and useful antimicrobial agents, there are occasional cases where these agents have proved ineffective. In such cases, the isolation of a resistant organism or the failure to identify the organism have provided problems in choosing an effective drug.

Of the organisms isolated, the Gram-negative enteric group of bacteria is most likely to show resistance or only partial susceptibility to the presently available antibiotics. Among these are various coliforms and Aerobacter aerogenes. The staphylococci have also shown some resistance; failures occur even when the organism is susceptible to in vitro tests.

When therapy must be undertaken in the absence of a bacteriologic diagnosis, the regimen must be based on (1) statistical evidence for the frequency of possible isolates, and (2) an optimal regimen for such organisms. Analysis of several series of cases shows that from 65 to 95% of each series have been identified with a streptococcus with the alpha streptococci predominating.

The fourth group of failures in management is a result of complications from inability to control the infection, or of residual damage when cure of the infection has been accomplished. Congestive heart failure resulting from valvular insufficiency or less well-defined myocardial injury may leave the cured patient as a cardiac cripple. Earlier diagnosis and adequate therapy should decrease these complications.

Rupture of the cusps of the aortic valve, with or without abscesses of the valve ring, may cause death before the infection can be eradicated.

Cerebral emboli may occur as a terminal event or as a complication during the diagnostic or early treatment phases. When the disease is uncontrolled and the emboli are septic, a meningitis may result.

Focal embolic glomerulonephritis may result from repeated small embolizations of glomerular capillaries; larger infarcts may also occur. This may be reflected in the urinary sediment with red blood cells and casts. The repeated damage to the kidney in untreated cases may lead to the development of uremia.

The major problems in the management of infective endocarditis are related to the rapidity of recognition of the disease and prompt initiation of adequate therapy. Many complications in this disease could be avoided if early diagnosis were made and treatment promptly started.

Because the best results with subacute bacterial endocarditis indicate that a mortality of 25% may be expected, the diagnosis of the disease in a

given patient implies that the chances of death are one in four. When therapy is delayed or inadequate, the chances of a fatal ending increase.

Generally, it would seem wiser to employ heavier and longer dosage schedules than the minimum required for the simpler, uncomplicated cases. Optimal regimens should be employed with full use of laboratory information as to the nature and susceptibility of the infecting organism. Where such services are not available or when it is not possible to obtain such information, the use of continuous intravenous therapy in massive doses seems to offer greater hope for cure than any other treatment.

There still remains the problem of insusceptibility of some infecting organisms. Until more effective antimicrobial agents are available, fatalities will be inevitable. Such cases, as well as those treated inadequately, will be largely responsible for the appearance of complications in the course of the disease. (Foltz, E. L., Problems in Management of Infective Endocarditis: GP, XVII: 145-152, March 1958)

* * * * * *

Chronic Idiopathic Jaundice

Recently, a new hepatic disease was described independently by two sets of workers, Dubin and Johnson, and Sprinz and Nelson under the terms "chronic idiopathic jaundice with unidentified pigment in liver cells" and "persistent nonhemolytic hyperbilirubinemia associated with lipochrome-like pigment in liver cells," respectively.

The disease manifests itself as a form of chronic or intermittent jaundice in young people. The jaundice fluctuates in intensity and is aggravated by intercurrent diseases. The disease may be lifelong and the prognosis is excellent. Since the original descriptions, new data have become available which have increased present knowledge of the disease; additional cases have come to light and follow-up data on the original patients have been collected. This later material has sharpened the outlines of some aspects of the disease which heretofore were only nebulous, although hinted at in the original observations. This article reviews all known cases and delineates the current knowledge of the subject.

Chronic idiopathic jaundice is an uncommon disease which tends to run in families and to be more common in the male sex. So far, only one case has been found in a Negro person, but it is not yet clear whether this is due to a lower incidence or to the greater difficulty in detecting scleral icterus in such persons. The disease has been found in different ethnic groups of Caucasian background in various countries in America, Europe, and Asia. In about half of the cases, the disease begins at birth or at puberty; by age 20, two-thirds of the patients had already noted jaundice.

Most patients complain of abdominal pain in the region of the liver; weakness, anorexia, nausea, or vomiting, and diarrhea are less common.

symptoms tend to occur during bouts of jaundice and disappear as jaundice wanes. Some patients seem to be free of symptoms at all times. Jaundice is recurrent and fluctuates in intensity. The liver is clinically enlarged and is tender in about one-half of the cases. Dark urine occurs in 50% of cases and pale stools in about 12%.

The pigment in the serum behaves like bilirubin, as judged by Ehrlich's diazo reaction with diazotized sulfanilic acid. It seems that in chronic idiopathic jaundice the liver cell is able to conjugate indirect bilirubin with glucoronic acid and convert it to direct bilirubin, but it cannot properly excrete the latter into the bile so that the direct bilirubin is somehow regurgitated back into the blood either directly or through the lymph. As direct bilirubin accumulates in the blood, it can probably again be slowly converted to indirect bilirubin. Because the bile pigment in the serum is in the direct-reacting, water-soluble form, it can be excreted by the kidney; this explains the presence of bile in the urine in the present cases.

The increased amount of urobilinogen in the urine of patients with chronic idiopathic jaundice suggests an excretory inadequacy on the part of the liver. The dark urine is accounted for by increased amounts of bile and oxidation products of urobilinogen.

Additional evidence for inadequate hepatic excretion is found in the retention of bromsulphalein by these patients. Retention of abnormal amounts of bromsulphalein occurs during episodes of jaundice and disappears as jaundice abates.

In about one-half the cases, the cephalin flocculation and thymol turbidity tests give abnormal values while jaundice is present, but return to normal as jaundice subsides. The significance of this is not clear. Serum albumin and globulins are present in normal amounts and the electrophoretic pattern appears normal.

A striking finding is the failure of the gallbladder to visualize on oral cholecystography, even though the gallbladder is normal. This occurs even when jaundice is absent. Intravenous cholecystography, used in seven cases in which orally administered dye had previously failed to display the gallbladder, was successful in two cases and failed in the remaining five. Although one must consider the possibility that the orally administered dye (iopanoic acid) is not absorbed by the intestinal tract, the most likely explanation is that the liver cannot excrete the dye at the normal rate. The greater success in displaying the gallbladder with the intravenously administered dye (iodipamide) may be due to a difference in the chemical structure of the two dyes or to a more concentrated delivery of the dye to the liver by the intravenous injection.

The liver is normal except for the pigmentation. Minimal histologic changes, other than pigmentation, are found in some cases, but these are either transitory or incidental. There is no histologic evidence of progressive hepatic damage.

In about one-half the cases the onset of jaundice is insidious; in the others, jaundice is first noted in association with, or in the wake of, another disease or major stress. Once instituted, the disease is apparently lifelong; the jaundice fluctuates in intensity and may disappear completely, only to recur later.

Jaundice is precipitated by many factors that constitute a strong metabolic stress. If the disease does not become manifest at birth, it tends to appear at puberty or somewhat later. Jaundice is also precipitated or aggravated by pregnancy, surgical operations, severe physical strain, alcoholism, and infectious diseases.

During pregnancy, the jaundice gradually becomes more intense, reaching its height in the third trimester and waning or disappearing completely after delivery of the child. Conversely, it is not yet clear whether the disease has an adverse effect on the offspring.

There is no known therapy for the disease. Nevertheless, the prognosis is excellent as regards life expectancy and the absence of progressive hepatic disease. Evidently the disease is compatible with long life; in one-fourth of the cases the disease had been present for more than 20 years. The patients are able to lead a relatively normal existence except when jaundice is at its height at which time their activities may be somewhat impaired by weakness, anorexia, and abdominal pain. Serial clinical and histologic studies indicate that there is no progressive hepatic damage. Patients should be apprised of the benign nature of their illness and encouraged to lead normal lives lest they become the victim of an overlay of symptoms of psychosomatic origin. (Dubin, I. N., Chronic Idiopathic Jaundice - A Review of Fifty Cases: Am. J. Med., XXIV: 268-289, February 1958)

* * * * * *

Trichinosis

Trichinosis is one of the most ubiquitous diseases of infectious origin. It has been estimated that one in every six persons in the United States, about 25,000,000, harbor the causative agent, Trichinella spiralis. Each year, 350,000 more acquire the infection and almost 16,000 may ingest enough parasites to produce detectable signs and symptoms. It is further estimated that about 5% of all those with symptomatic infection die, although many of these cases are undiagnosed, unrecognized, or unreported. The average annual number of reported cases is about 336.

Supervision of distribution of pork and pork products should, if properly conducted, go far in eliminating trichinosis. Unfortunately, the high incidence of this disease reflects the casual attitude of the public, comparable perhaps to the indifference shown to the startling figures of automobile accidents. The prolonged duration of disability, the severity of complications,

and the not uncommon deaths represent threats to public health that should demand prompt correction.

Within the past 7 years, a few cases have been treated with corticosteroid, hormones, and corticotropin; the results have ranged from satisfactory to spectacular. It is surprising then to find that a perusal of the literature reveals only a total of 20 cases of trichinosis so treated. Not one of the persons treated was under 12 years of age.

Trichinosis is a disease caused by T. spiralis, a small round worm which enters the body only by the ingestion of pork containing encysted living larvae. When the cyst wall is digested off, the larvae develop into adult worms, usually in the duodenum. The female worms burrow into the duodenal mucosa and deposit their ova. When the ova mature into larvae, they invade the blood and lymph channels and are carried to all parts of the body. The sites of predilection are skeletal muscle, chiefly diaphragm, deltoids, and gastrocnemius muscles where the larvae become encysted. Although they may invade other organs, such as brain and heart muscle, they do not become encysted there.

The clinical manifestations correspond to the location of the trichinae. While the worms are in the duodenum, there is nausea, vomiting, and malaise. When the larvae invade the blood stream, there appear fever, leukocytosis with high eosinophil count, and a macular eruption. As they are deposited in the muscles, they produce muscle pains and tenderness; cough may be due to pulmonary invasion; cardiac involvement gives rise to myocarditis, and central nervous system effects result from deposition in the brain tissue. Although this phase averages about 2 weeks, it may persist as long as the adult worms produce eggs—up to 6 or 7 weeks. When the larvae become encysted, the signs and symptoms subside, although vague muscle pains may persist for a year or more.

The development of high eosinophil count in the blood and skeletal muscles, the urticaria-like swelling of the periorbital regions, the presence of antibodies in the skin and blood which yield positive skin and precipitin tests, and complement-fixation reactions are strongly indicative of allergic responses of the host to the invading trichinae. It would seem logical, therfore, that a suitable approach to treatment could include some form of antiallergic therapy.

Although the number of reported cases is small, corticotropin (ACTH) and cortisone have been found extremely successful in the treatment of the signs and symptoms of the disease and in the control of such serious complications as encephalopathy and myocarditis.

This is the first report of the successful use of corticotropin in trichinosis in children under 12 years of age. The use of large doses of corticotropin in a short course is recommended. (Greenstein, N. M., Steinberg, D., The Prompt and Effective Response of Trichinosis to Cortocotropin: Am. J. Dis. Chil., 95: 261-268, March 1958)

Contrast Media for Excretory Urography

In the past several years, there has been a considerable renewal of interest in the development of new contrast materials for excretory urography which might improve the radiographic density of the excreted material and might also be better tolerated by the patient than those substances in use for many years. The first of these newer substances was Urokon (sodium acetrizoate) in 30% solution as reported by Nesbit and Lapides in 1950. Subsequently, a 70% solution of the same compound was tried by various authors including Barry and Rose, and Nesbit and Nesbitt in 1953. Finally, a concentration of 50% became more popular, following its introduction in 1954. The reports of the investigators cited—as well as the reports of others—attested to the greater efficiency of Urokon as compared with the older contrast material, especially Diodrast (iodopyracet) and Neo-Iopax (sodium iodomethamate).

Early in 1955, the authors were asked to evaluate another new contrast material bearing the trade name Hypaque (sodium diatrizoate), which was being investigated at the same time in other hospitals. Immediately, it was apparent that a careful appraisal of this new medium could be obtained only by direct comparison, in respect to relative efficiency and safety with other contrast substances already in use. A comparative study was, therefore, undertaken of Hypaque 50%, Urokon 50%, and Neo-Iopax 50%.

While the investigative study was being carried out, two other new compounds made their appearance. These were Renografin (mixture of sodium and methylglucamine salts of diatrizoate), of which the authors learned in the summer of 1955, and Miokon 50% (sodium diprotrizoate), which came to their attention late in 1955. To make a more complete investigation, it was considered necessary to add these compounds to the clinical studies.

A total of 1726 injection studies were done with the various contrast media: 318 with Neo-Iopax, 152 with Urokon, 281 with Miokon, 345 with Hypaque, and 630 with Renografin. The cases were not selected in any way, and the different contrast materials were used more or less at random. No attempt was made to include the same number of cases in each group as the authors were governed by the available supply of each of the contrast media. In order to standardize the procedure, all patients received the same amount of each compound used, 20 cc. being introduced intravenously in exactly 60 seconds (except in the occasional case where the patient reaction was so pronounced that the injection had to be slowed). Films were exposed at 5, 10, and 15 minutes following the injection, and the radiographic quality was subsequently evaluated without prior knowledge of the compound employed. So far as possible, extraneous matters, such as bowel gas, over all film density or quality, and other technical factors were discounted and the attempt made to evaluate only the contrast produced by the excreted material.

A careful record was kept in each case as to the presence of any local or systemic reaction, no matter how mild. The patient received no special preparatory drugs before injection, and only the rare severe reaction or truly allergic response (particularly urticaria) was given any drug or other treatment. All other reactions subsided quite promptly and spontaneously. Preliminary testing in all cases was carried out by means of the conjunctival test.

The radiographic quality of the pyelograms was graded as follows: (1) no visualization, (2) poor visualization, (3) fairly good (satisfactory) contrast density, (4) good to excellent contrast density. The last group was reserved for those cases in which the quality seemed to approach that usually expected with retrograde pyelography, i.e., a relatively dense shadow with well defined contrast as compared to the surrounding structures. The other categories are self-explanatory.

The incidence of reactions, particularly nausea and vomiting, and arm and shoulder pain, was definitely lower with Hypaque and Renografin than with the other compounds investigated.

Miokon afforded a slightly higher percentage of excellent pyelograms than any of the other media, although the figure was so closely approached by Hypaque and Renografin that the difference is without statistical significance. The number of satisfactory and excellent studies obtained with Neo-Iopax was significantly lower.

In the opinion of the authors, Hypaque and Renografin are the most satisfactory media available for excretory urography when the factors both of patient tolerance and radiographic quality are considered. Truly allergic reactions and the more serious vasomotor reactions will probably occur in about the same relative frequency with all the contrast materials currently used, although this is difficult to evaluate statistically because the percentage of such reactions is exceedingly low with all of the modern urographic media. (Tatelman, M., Pakusch, R. S., A Comparative Evaluation of the Newer Contrast Media for Excretory Urography: Radiology, 70: 238-241, February 1958)

* * * * * *

Combined Therapy for Carcinoma of the Lung

Carcinoma of the lung presents a discouraging therapeutic problem from the standpoint of both the surgeon and the radiologist. Its increased incidence has served to bring the shortcomings of the management of this disease into sharper focus. Carcinoma of the stomach has long been the most frequently encountered neoplasm in the male, but malignancy of the lung is rapidly overtaking it. The great majority of patients with this condition are found to have progressed to an inoperable stage due to the

insidious and silent onset of the disease and to delays of the patient in presenting himself for examination.

Roentgen therapy as applied to carcinoma of the lung is generally palliative in nature, the question having been one of optimal dosage levels until the past 15 or 20 years. The development of supervoltage and megavoltage apparatus with energies in excess of 1 to 2 mev., and more recently the betatron, linear accelerator, and isotope teletherapy apparatus, has resulted in a tendency toward higher tumor doses; their attainment has dominated the clinical approach. Yet, the question of optimum dosage remains unsettled and it is claimed by some that no correlation exists between an increase in tumor dose from moderate (2500 to 3500 r) to high levels (4000 to 6000 r).

The authors reviewed 788 cases of carcinoma of the lung seen in the Department of Radiation Therapy, Harper Hospital, Detroit. They have analyzed the results of various methods of treatment exclusive of surgical procedures in 393 histologically proved cases.

The 393 cases of histologically proved carcinoma of the lung constituting the body of this study were diagnosed by bronchoscopy, exploratory thoracotomy, the expectoration of tumor tissue in one instance, and scalene or supraclavicular lymphadenectomy combined with classic chest roentgenographic manifestations of carcinoma of the lung. Lesions of the trachea, pleura, and mediastinum were excluded. Pancoast tumors, although usually adenocarcinomas histologically, are classified separately due to their rather distinct clinical characteristics and due to an early method of classification in which the exact cell type was not recorded.

Originally, only 200 kv. roentgen therapy was used. In 1932, 550 kv. therapy was instituted, and from 1929 through 1945, 30 patients were treated with a combination of roentgen therapy and intrabronchial radium. The more recent introduction of chemotherapeutic agents in cancer management added another valuable approach. Because nitrogen mustard gave promise of therapeutic effectiveness in cancer of the lung, it was thought that the combined use of nitrogen mustard and roentgen therapy might offer greater palliative relief than either agent alone. Consequently, since January 1947, and continuing to the present time, nitrogen mustard was administered in combination with the course of roentgen therapy in a routine fashion. This study compares the results of combined roentgen therapy and nitrogen mustard with those formerly obtained by other methods of treatment.

The combined use of nitrogen mustard and radiation therapy brings to bear upon a difficult palliative problem two agents known to effect significant degrees of symptomatic relief in inoperable lung cancer. Watson has reported that he obtained a definitely better survival rate with combined nitrogen mustard and roentgen therapy. He was encouraged to the point of combining betatron irradiation and chemotherapy in the management of these cases. Others have found that there is a significant improvement in symptomatic

relief of these patients. Some authors contend that the life span is not lengthened, although clinical results with the combined treatment show greater objective evidence of tumor regression.

Roswit and Kaplan have employed nitrogen mustard in the treatment of some 40 patients with carcinoma of the lung when irradiation was no longer feasible or effective. Of this group, 30 patients experienced subjective improvement and 19 showed objective improvement. Remissions from one to seventeen weeks with an average of three and one-half weeks were noted. They also collected 254 cases from the literature (not all carcinoma of the lung, however) which had been treated with nitrogen mustard up to 1951. Of these, 134 (52.8%) were observed to have had a favorable response. None of these cases were given nitrogen mustard and roentgen therapy simultaneously. The authors concluded that nitrogen mustard should never be used in place of roentgen therapy, but that in spite of limitations, it provides a valuable adjunct to irradiation in the management of inoperable bronchogenic cancer.

Garland and Sisson have shown in a recent report that moderate tumor doses of from 1500 to 3000 r in 4 weeks gave an average survival of 8.3 months as compared with an average of 5.3 months survival in a group of cases which were preponderantly treated with less than a 1500 r tumor dose. They concluded that moderate dosage levels are palliatively useful, but that heavy doses occasionally can be curative. Anaplastic tumors responded better than squamous cell lesions which coincides with the authors' experience.

Guttman has reported on the results in 100 patients with inoperable carcinoma of the lung treated by 2 mev. radiation therapy and indicates that those patients living longer than 18 months received 5000 r in 5 weeks or 6000 r in 6 weeks. This would tend to indicate that increasing tumor dose would give a proportionately longer survival. Some authors contend that such a relationship has not been extablished. It would seem that the moderate doses employed in the present series indicate no direct relationship between dosage levels and degree of longevity, although a distinct difference is seen in cases receiving only minimal doses as compared with those receiving moderate doses.

The combined use of roentgen therapy and nitrogen mustard tends to improve the early survival rates within the first year as has been pointed out by Watson despite rather disappointing over all results. In general, the authors' results of treatment coincide with previously published statistics. Oat cell carcinomas are definitely better palliated with the combined method than lesions of other cell types.

The results of this study indicate that the concomitant administration of nitrogen mustard with roentgen therapy of both 200 kv. and 550 kv. energies has improved the early survival rates, increasing the percentage of cases living up to 1 year from 50% to 58.4% in the undifferentiated and oat

cell types. This does not represent a marked increase, but is believed to warrant the continuation of a program of combined roentgen therapy and nitrogen mustard in the management of inoperable carcinoma of the lung. The rather favorable results obtained in the treatment of carcinoma of the lung with roentgen therapy and intrabronchial radium have been demonstrated to be due to the early stages of the disease in this group of patients—a group which is now treated primarily by surgical means. Lesions of oat cell or undifferentiated cell type respond better to all forms of therapy exclusive of surgical methods, but particularly well to the combination of roentgen therapy and nitrogen mustard. (Krabbenhoft, K. L., Leucutia, T., Combined Roentgen Therapy and Nitrogen Mustard in Carcinoma of the Lung as Compared to Other Methods: Am. J. Roentgenol., 79: 491-503, March 1958)

* * * * * *

Newer Progestins in Treatment of Endometriosis

Endometriosis may be defined as the presence of functioning endometrial tissue outside of its normal situation, but usually confined to the pelvis in the region of the ovaries, uterosacral ligaments, and uterovesical peritoneum. It is characterized symptomatically by progressive, increasingly severe pain associated with, or occurring just prior to, menstruation. The crippling characteristics of this malady, occurring during the reproductive period of women, prevent fulfillment of marital potential because sexual intercourse is often painful and childbearing frequently impossible. Definitive treatment has all too often been surgical in the way of hysterectomy and castration with development of subsequent neuroses and occasional psychoses.

The present concept of treatment is predicated on the fact that pregnancy improves already existing endometriosis or prevents its development. Definite proof of both statements is lacking and the meager amount of available evidence is based on published observation by a few clinicians who have been interested in the subject. There is no doubt that during the period of the pregnancy itself the symptoms of endometriosis are alleviated. It cannot be denied, however, that such improvement is noted also during periods of induced anovulation whether brought about by estrogens or androgens.

Scott and others have pointed out the relationship of pregnancy to endometriosis already present and have noted changes in endometriotic areas during gestation. There is no doubt that such changes are due to increasing and sustained levels of estrogen and progesterone and not simply to suppression of the pituitary. The unpredictability of permanent relief in endometriosis following the use of estrogenic substances alone has become apparent during the last few years. This may be due to the fact that some areas of endometriosis do not respond to estrogenic substances as well as the endometrium does. Or perhaps the temporary improvement with estrogens is mediated via the

pituitary through suppression of ovulation. Scott and Wharton have suggested that the growth of endometriosis is roughly proportional to the number of episodes of progesterone withdrawal from an estrogen-primed endometrium. Estrogen therapy also has the disadvantage of occasionally resulting in rather profuse "break-through" bleeding, endometrial hyperplasia, and hypermenorrhea at the time of withdrawal of the hormone.

Androgenic substances, while adequately documented as having produced desirable results in endometriosis, probably exert their effect through inhibition of gonadotrophic substances, although direct effect of the substance upon the endometriotic areas has been suggested. The undesirable side effects of hirsutism, acne, and deepening of the voice occur sufficiently often to cause the clinician and the patient considerable concern. The use of methylated preparations has also resulted in occasional hepatitis and jaundice.

In the present series, only 3 of the 12 patients had endometriosis proved microscopically (2 pre-treatment and 1 post-treatment). The objection may logically be made that such treatment was carried out in the absence of a positive diagnosis. This cannot be denied, but in an effort to reduce the incidence of diagnostic error, all patients were selected for treatment by the author and all subsequent examinations and biopsies were performed by him. The patients were not selected on the basis of history alone because pelvic pain may be caused by such a multiplicity of factors including psychoneuroses. In all patients, there was definite involvement of the posterior cul-de-sac and/or utero-sacral ligaments with fixation of the uterus. Adnexal masses were present in some, but not in all cases.

The combination of progestational and estrogenic substances in large and continuing doses has not, to the authors knowledge, been previously reported. This produced amenorrhea as well as a decidual reaction in the endometria of all patients. In one patient operated on at the termination of therapy, a decidual reaction was noted in the areas of endometriosis subjected to biopsy and it is assumed that this occurred in the other patients. All subjects were improved during the period of their pseudopregnancy both subjectively and objectively except for the few who noted crampy uterine pain and hypermenorrhea. Whether this temporary improvement will be semipermanent or permanent will depend upon careful observation and examination during the next few years.

In future cases, the use of culdoscopy to make certain of the diagnosis prior to treatment may be useful. Variation of dosage of both drugs to prevent uterine pain and "break-through" bleeding is now being studied. It is possible that better results could be obtained by eliminating estrogenic substances entirely because in the presence of adequate endogenous estrogen a decidua may be produced with the progestins alone. This method would accomplish anovulation, decidual transformation of the stroma, and possibly would reduce the growth of endometrial vasculature. (Kistner, R. W., The Use of Newer Progestins in the Treatment of Endometriosis: Am. J. Obst. & Gynec., 75: 264-277, February 1958)

Toxicity of Boron Hydrides

A number of articles have been published in the open literature on the toxicity of di-, penta-, and decaboranes. A partial list follows:

A. M. A. Archives of Industrial Health

Vol. 4, No. 3, September 1951
Vol. 8, No. 4, October 1953
Vol. 10, No.'s 1 (July), 2 (August) and 4 (October) 1954
Vol. 11, No. 2, February 1955
Vol. 13, No. 4, April 1956
Vol. 14, No. 2, August 1956
Vol. 16, No. 6, December 1957

In general, the boranes are extremely toxic. Based on animal experimentation, borane toxicity appears comparable to phosgene, chlorine, fluorine, and arsine. Liquid boranes will irritate the skin and cause acute local inflammation with the formation of small blisters, redness, and swelling. These compounds can be absorbed through the skin and membranes of the mouth and eyes. Airborne vapor in concentrations below that harmful to health on inhalation is not irritating to the eyes. The median detectable olfactory concentrations reported on boranes are:

Diborane	3.3 ppm
Pentaborane	1.0 ppm
Decaborane	0.07 ppm

The tentative threshold limit values for boranes are:

Diborane	0.1 ppm
Pentaborane	0.00 ppm
Decaborane	0.05 ppm

Diborane hydrolyzes rapidly in the lungs causing pulmonary edema and hemorrhage. It is only slightly soluble in water and the amount absorbed by the blood is low.

Early symptoms are tightness of chest, coughing, and respiratory difficulties. This is a respiratory irritant causing pulmonary edema. Brief exposure produces minor pulmonary irritation with congestion of the trachea and lungs; prolonged exposure may also cause damage to the kidneys and liver.

Pentaborane and Decaborane on acute exposure affect primarily the central nervous system. Early symptoms are dizziness, headache, drowsiness, incoordination, nausea, and vomiting. In severe poisoning, symptoms are abnormal muscular contractions or twitching followed by convulsions and coma. This may be followed by hiccups; difficulty in breathing; skin pallor; poor muscular coordination; and visual, auditory, and speech difficulties. In chronic exposure, liver and kidney damage are likely to occur; central nervous system symptoms are less prominent.

The following first aid procedures and preventive measures have been recommended for those exposed to excessive amounts of toxic vapors or liquid boron hydrides:

1. Immediately remove the individual to an area free from further exposure.
2. If pulmonary edema occurs, keep patient in a recumbent position.
3. Administer oxygen or use a positive pressure respiratory device such as the penolator.
4. If material has been splashed on the skin, wash immediately with 3% ammonia followed with copious quantities of water.
5. Burns or frostbites should be treated in the customary manner after the contaminant has been immediately and thoroughly rinsed off.
6. Central nervous system symptoms should be treated symptomatically.
7. Perform periodic examinations on urine and blood in conjunction with physical examinations to screen for subacute exposures.
8. Barbiturates or mesantoin may be useful in the control of convulsions.

(OccMedDispDiv, BuMed)

* * * * * *

Biochemical Research

The Office of Naval Research has funded in fiscal year 1958 the following projects in the field of Biochemistry:

Title	Contractor	Investigator
Development of C^{14} Labelled Biochemical Compounds	Schwarz Laboratories, Inc. 230 Washington St. Mt. Vernon, N. Y.	D. Schwarz
Absorption Spectra of Peptides and Proteins in the Far Ultraviolet	Chicago Med. School 710 S. Wolcott Ave. Chicago 12, Ill.	L. J. Saidel
Physico-Chemical and Immunological Characteristics of Allergens	Cornell University 1300 York Ave. New York 21, N. Y.	Mary Loveless

Title	Contractor	Investigator
Characterization of Viral Proteins	University of Calif., Virus Laboratory Berkeley 4, Calif.	H. Schachman
Hormone Action Mechanisms	University of Calif. Los Angeles 24, Calif.	B. H. Levedahl
Amino Acid Metabolism: Relationships among Glutamic Acid, Proline, and Ornithine	Rutgers University New Brunswick, N. J.	H. Vogel
Relationship between Protein Structure and Protein Function	University of Minn. Minneapolis 14, Minn.	R. Lumry
Experimental Study of Enzyme Systems	Edsel B. Ford Inst. for Medical Research Detroit 2, Mich.	T. Singer and E. Kearney
Enzymes of Skin Fungi	Columbia University 630 West 168th St. New York 32, N. Y.	I. Mandl
Blood Pigment Metabolism	University of Penn. 3320 Walnut St. Philadelphia 4, Pa.	D. Drabkin
Heat Stable Enzymes	State College of Washington, Pullman, Wash.	L. L. Campbell
Photosynthetic Enzymes	University of Calif. 3048 Life Sciences Bldg. Berkeley 4, Calif.	D. I. Arnon
Protein Metabolism	St. Luke's Hospital Amsterdam Ave. and 113th St. New York 25, N. Y.	A. A. Albanese
Structure of Proteins	Calif. Inst. of Technology Gates and Crellin Lab's Pasadena 4, Calif.	L. Pauling and R. Corey

American Board Certifications - Inactive Reserve Officers

American Board of Anesthesiology
LTJG Robert J. Dean (MC) USNR

American Board of Internal Medicine
LT Ralph A. Kilby (MC) USNR
LT William J. Kuzman (MC) USNR
LTJG J. Warren McKibben, Jr. (MC) USNR
LT John B. Reardan (MC) USNR

American Board of Obstetrics & Gynecology
LT Don A. Guinan (MC) USNR
LT Arthur E. Klemme (MC) USNR

American Board of Pathology
LCDR Donald J. MacPherson (MC) USNR

American Board of Pediatrics
LT Edward S. Sherwood (MC) USNR
LT Walter L. Wilder (MC) USNR

American Board of Radiology
LT John L. Bircher (MC) USNR
LCDR Wallace D. Buchanan (MC) USNR
LT John J. McCutcheon, Jr. (MC) USNR
LT Willis J. Taylor (MC) USNR

American Board of Surgery
LT Warren W. Francis (MC) USNR
LT Donald L. Gordon (MC) USNR
LT "J" Raymond Hinshaw (MC) USNR
LT Maurice N. Levy, Jr. (MC) USNR
LTJG John M. Lore, Jr. (MC) USNR
LCDR Keith Merrill, Jr. (MC) USNR
LTJG William S. Reed (MC) USNR
LT Charles S. Rogers (MC) USNR
LT Arthur M. Simpson (MC) USNR
LTJG John A Tognazzi (MC) USNR

American Board of Urology
LTJG William J. Nelson (MC) USNR

* * * * * *

From the Note Book

1. Admiral B. W. Hogan, Surgeon General of the Navy, announced that CDR G. W. Hyatt MC USN, Director of the Tissue Bank Department at the U. S. Naval Medical School, Bethesda, Md., attended the Second International Symposium on Freezing and Drying held at Beveridge Hall, Senate House, London, Eng., during the period April 1-2, 1958. Dr. Hyatt gave a paper entitled, "Storage of Human Tissues for Surgical Application," in the section of the symposium devoted to that subject. (TIO, BuMed)

2. One of the Navy Department's highest civilian awards, the Certificate of Merit, has been presented to the CIBA Pharmaceutical Company. Representing the Secretary of the Navy, Assistant Secretary of the Navy for Material, F. A. Bantz, presented the Certificate to Mr. T. F. Davies Haines, President of the CIBA Company. The Certificate, signed by the Secretary of the Navy, was awarded to the CIBA Company for outstanding service to the Navy Department in the fields of health and safety. (TIO, BuMed)

3. Expectant mothers in Chelles, France, invest complete confidence in their obstetrician, Dr. Albert-André Nast, who for the past 26 years has been totally blind. When vision left him in 1931, he was encouraged by the warm support of his patients to return to full-time practice. Now in his 70's, Dr. Nast has delivered upwards of 4000 babies with no maternal mortalities. This achievement, impressive as it is, marks a second career for Dr. Nast—the first was devoted to the practice of law and service as a member of the French legislature. His decision to switch to medicine and obstetrics came after the loss of his first wife in childbirth. (Scope Weekly, 12 March 1958)

4. The Second Annual Dental Research Conference was held 19 March 1958 at Detroit, Mich. The conference was held the day before the meeting of the International Association for Dental Research. The purpose of the conference was the exchange of information among the naval personnel who are engaged in dental research. (Dental Branch, Research Div., BuMed)

5. Captain O. E. Van Der Aue, Commanding Officer, Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md., on 21 February 1958, displayed the dental research facilities in the new wing of the Naval Medical Research Institute. Armed Forces dental officers, civilian dental scientists and educators from the urban area of Washington, D. C., attended the presentation at which Rear Admiral R. W. Taylor, Inspector-General of Dental Activities in the Navy's Bureau of Medicine and Surgery, was principal speaker. The dental research staff, consisting of Captain C. A. Ostrom, Captain F. L. Losee, Commander H. W. Lyon and R. Van Reen, Ph D., demonstrated their current research projects as the guests were escorted

through the dental research spaces consisting of 3 offices, 7 laboratories, and 3 animal rooms. (NMRI)

6. It appears evident that the use of chemical disinfectants in dentistry should be limited to instruments that do not penetrate the soft tissue. The most reliable methods of sterilizing are autoclaving with steam under pressure or dry heat at 320° F. for 1 hour. If neither of these methods can be used, the syringe should be boiled for 15 minutes. There is some reason to believe that adding an alkaline agent, such as sodium carbonate, to the water will increase the certainty that the hepatitis virus will be killed by boiling. (Editorial, J. Mich. State Dental Association, April 1957)

7. Duografin, a combination contrast medium for the simultaneous performance of urography and cholecystocholangiography was administered to 25 patients without serious consequence. Most of the patients showed excellent visualization of both tracts. In almost all patients where non-visualization of one or the other tract was encountered, pathological impairment of function was demonstrated. (Radiology, February 1958; B. Garfinkel, M. D., N. J. Furst, M. D.)

8. A group of 202 consecutive cases of pleurisy with effusion, presumably tuberculosis, is reported. All of the patients had positive tuberculin tests. In 176 of the children, 87% of whom received no specific therapy, the effusion was not associated with any form of tuberculosis with a serious prognosis. This group is analyzed in detail. (Am. Rev. Tuberc., February 1958; E. M. Lincoln, P. A. Davies, S. Bovornkitti)

9. True pulsus alternans is a sign of left ventricular weakness that demands appropriate therapy before congestive failure becomes manifest. Measures important in the treatment of left ventricular failure including digitalization, low sodium regimen, and when indicated, mercurial diuretics should be instituted. (GP, March 1958; P. W. Seavey, M. D., J. W. Hurst, M. D.)

10. The effect that each of several technical factors had on the doses of roentgen ray radiation that reached the dental patient while being x-rayed was studied. Under certain conditions, it was found that a complete x-ray examination of the jaws of the adult patient resulted in 23.8 r (measured in air) being administered to the face and approximately 1/10,000 of that amount or 2.14 mr effectively reaching the male gonads. The length of the patient's torso was found to influence greatly the gonadal dose received. The relative gonadal dose for the 3-year old child was found to be one and three-fourths times as much as was received by the adult. Various changes in technique were recommended to further reduce the amount of radiation that reaches the dental patient. (J. A. D. A., March 1958; A. G. Richards, M. S.)

11. The successful management of parotid tumors combines complete removal of the neoplasm with preservation of the facial nerve. It depends on 2 factors: a thorough understanding of the natural history of these tumors and familiarity with the surgical anatomy of the area. (Arch. Otolaryng., March 1958; S. L. Perzik, M. D.)

12. Fourteen cases of carcinoma of the female urethra treated with irradiation or a combination of irradiation and surgery are reported. Six of eleven patients treated for more than 5 years are well. Three patients treated for less than 5 years are well at four, two and one-half, and one and one-half years after therapy. (Am. J. Roentgenol., March 1958; C. B. Brack, M. D., R. J. Dickson, M. D.)

13. This report summarizes current opinion regarding the role of respiratory viruses as agents of heart disease. (Ann. Int. Med., February 1958; E. N. Silber, M. D.)

* * * * * *

SUBMARINE MEDICINE SECTION

Is the Valsalva Maneuver Safe?

A 19-year-old submarine school candidate was being tested for ability to equalize pressure changes prior to submarine escape training. He was one of a group in a recompression chamber while the pressure was being increased to 50 lbs. per square inch (psi) by gauge above atmospheric pressure. It was noted the patient appeared to be using excessive force in the valsalva maneuver to equalize pressure in his middle ears. He was cautioned against the use of excessive force and shown how it should be done properly. After reaching 50 psi gauge, the pressure was released gradually. He made no complaint of any distress on returning to the surface.

Several hours later he reported that he had observed a vague feeling of tightness in the chest during the ascent phase of the pressure test, although he had disregarded it at the time. In the next few hours, he developed increasing discomfort in the chest accompanied by substernal pain on inspiration, difficulty in swallowing and soreness and stiffness of the neck.

When he reported for medical attention, subcutaneous crepitus could be detected over the upper chest and in the neck. A chest x-ray showed both lung fields to be clear, but indicated the presence of air in the mediastinum and in the pericardial space. Later, a loud "precordial crunch" was noted. The patient was splinting the entire rib cage. Heart action was normal.

Because of the steady increase in severity of symptoms, it was decided to treat him by recompression. (Note: This was a case of mechanical trauma related to breathing compressed air and was not a case of decompression illness.)

Pressure was built up gradually so the patient would be able to equalize without undue exertion. The ease of breathing was improved at 50 feet simulated depth. It was almost normal at 80 feet and crepitation could no longer be demonstrated. At 165 feet simulated depth, the patient noted slight soreness in the neck, but was otherwise asymptomatic and physical examination was negative.

The patient was treated by U. S. Navy Treatment Table 3. Upon completion of this gradual decompression, only slight crepitation in the anterior area of the neck could be felt and some could be heard along the sternal borders at the second and third interspaces.

A chest film taken at the completion of treatment indicated some air was still present in the mediastinum and in the pericardial space, but much less than was seen before treatment. Routine blood and urine examinations were within normal limits.

During observation in the hospital, following treatment in the recompression chamber, the precordial crunch again became audible, but disappeared within 24 hours. There were no other symptoms other than slight soreness in the neck. Chest films taken six days following the incident indicated complete resolution of the mediastinal and pericardial air.

The archives of diving medicine contain several accounts of unusual and perplexing incidents following "pressure tests" in a recompression chamber. This case can be classed as a relatively mild symptom complex. Others have indicated the presence of air embolism accompanied by unconsciousness or dizziness suggesting vestibular bubbles.

It can be said that this case illustrates the possibility of traumatically introducing air into the lung substance by forceful execution of the Valsalva maneuver. While this might be a relatively minor matter in ordinary clinical practice and in aviation medicine, it has dangerous potentials in the field of diving medicine because the air introduced is under pressure. When the pressure is reduced to atmospheric pressure the air bubble expands. The symptoms produced depend on the location and size of the bubble. Recompression was an astute therapeutic procedure in this case.

* * * * * *

DENTAL SECTION

Dental Interns for Fiscal Year 1959

Ensigns 1995/Dental who are scheduled to graduate from dental schools in June 1958 have been selected for participation in the Navy Dental Intern Program for the period July 1, 1958 to June 30, 1959. These Ensigns will be appointed as Regular Navy Dental Corps officers upon acceptance of this year of training. Selected were:

Amato, Angelo Emanuel	New York University
Arnold, Charles Tedlu	Tufts University
Begin, Raymond Joseph	Marquette University
Bitter, Norman Clarence	Univ. of So. California
Cavalaris, Constantine John	Ohio State University
Corio, Russel Lawrence	Western Reserve Univ.
Creedon, Robert Lewis	University of Buffalo
Gentry, Jesse Thomas	University of California
Hillenbrand, Ronald Edward	Loyola Univ. of Chicago
Johnson, Ronald Howard	University of Minnesota
Joy, Edwin Douglas, Jr.	University of Pennsylvania
Koutouzakis, Henry Peter	Temple University
Nable, Raymond Daniel	Emory University
Richter, Henry Edward, Jr.	University of Maryland
Stocker, Ralph Robert	University of Michigan
Thompson, Ferris Purdum	Georgetown University
Toolson, James Richard	Loyola Univ. of Chicago
Verunac, James Justin	Northwestern University

* * * * * *

NDS Training for Inactive Officers

Twenty-one inactive Naval Reserve Dental officers set aside their private practices to attend a two-weeks' course in Dental Military Training at the U. S. Naval Dental School, National Naval Medical Center, Bethesda Md., March 10 - 21, 1958. Their training covered subjects concerning the Naval Reserve Program, functions of the Dental Departments, professional lectures, and a review of advances in the Casualty Treatment Training Program.

Training also included the medical aspects of special weapons and radioactive isotopes with emphasis on basic concepts of atomic medicine.

* * * * * *

Precious Dental Metals - Custody of
(BuMed Notice 6750)

This notice clarifies the requirements for custody and security of precious dental metals.

During an inspection of Far East dental activities, November - December 1957, the Inspector General, Dental, found that some activities having dental prosthetic laboratories were not conforming to instructions in regard to assigning custody of precious dental metals, and that at some activities precious metals in the Navy Stock Account were being carried as an asset in the Inventory of Precious and Special Dental Metals (NavMed 1301).

Article 25-13, Manual of the Medical Department, requires that all precious metals, except those required for immediate use or in cases under construction, shall be maintained in locked storage under the direct custody of an officer. This may be an officer of the Dental or Medical Service Corps or a commissioned Dental Service Warrant Officer. Precious metals issued as a working stock for immediate use in fabrication of cases may be placed in custody of enlisted personnel. Accurate accounting of precious metals received and issued shall be kept on the Precious Metal Issue Record (NavMed 1300). Precious metals carried on the Navy Stock Account will not be taken up on the NavMed 1301.

* * * * * *

RESERVE SECTION

The Navy's Ensign Medical Program

Originally established in 1941 to afford undergraduate medical students an opportunity to affiliate with the Naval Reserve and to assure legal deferment from active duty until graduation, the Navy's Ensign Medical Program is entering its seventeenth year of existence with ever increasing numbers of participants who have indicated their desire to serve with the Navy's Medical Department during their anticipated period of obligated service.

In the past several years, the summer vacation training program for these student officers was conceived and gradually expanded to include Research Clerkships at Naval Research Activities, Clinical Clerkships at Naval Teaching Hospitals, and Midshipman Cruise Training on board combatant Naval vessels. In addition, the Senior Medical Student Program was developed and authorized as a career incentive pointing towards a commission in the Medical Corps of the Regular Navy.

The summer vacation training program not only provides the Ensign medical officer with an excellent orientation into the military service, but he also receives a more than adequate "birds-eye view" of Naval medicine at its best. No doubt, many participants have been favorably impressed because the numbers of Ensign medical officers continue to grow and the applicants for summer training and the Senior Medical Student Program continue to exceed the numbers that can be selected. Many participants have affirmed their favorable impression of Naval medicine by spreading the "word" among their classmates. "Good news travels fast," and the numbers of medical students desiring membership in the Ensign Medical Program increased to such an extent that a more accelerated commissioning procedure for these candidates was evolved early in 1957. In addition to all local officer of Naval Officer Procurement, applications from eligible medical students are now accepted at Main Recruiting Stations and Naval Hospitals. Also, Professors of Naval Science at colleges and Commandant's Representatives at medical schools have been authorized to furnish essential information to interested individuals.

The Navy's Ensign Medical Program is now considered to be the principal source of qualified candidates for the Naval Intern Program, the Regular Navy, and the Naval Reserve. The benefits, advantages, and opportunities within this program merit the individual medical student's most careful attention. These are:

1. If you can meet the professional, educational, and physical requirements pertaining to this program, you are eligible and may be appointed to commissioned status as Ensign (Medical) U. S. Naval Reserve for inactive duty while completing your medical studies. The Ensign (Medical) officers are Naval Reserve officers on inactive duty in the fullest sense and are entitled to all the privileges commensurate with their rank and classification.
2. You are legally deferred from military service in accordance with the provisions of the Universal Military Training and Service Act, as amended, so long as you remain in good standing in medical school, or until graduation and completion of no more than 12 months' internship.
3. Your period of active duty required by Selective Service legislation, if any, is performed as a medical officer with the U. S. Navy, which is presumed to be the service of your choice.

4. You perform your period of obligated active duty, if any, immediately upon completion of internship instead of being subject to induction by the Selective Service System at a later date with consequent interruption of private practice or residency training. This provision does not render you ineligible for consideration for deferment, upon individual request, for the purpose of pursuing postgraduate training immediately upon completion of internship under the terms of any programs which may be administered by the Department of Defense or the Department of the Navy at the time you complete your internship.

5. You may associate with drilling units of the Naval Reserve while on inactive duty, often in a pay status at Naval Reserve training centers. In this manner, you gain valuable and worthwhile orientation and indoctrination into the naval service before entering on extended active duty. Moreover, you accrue promotion and retirement point credits.

6. In the event a Naval Internship is desired, you are given preferential consideration by the Department of the Navy in the selection of applicants for the Naval Intern Program.

7. You have the opportunity to compete for a Naval Research Clerkship, a Naval Clinical Clerkship, or a Midshipman Cruise. (Note: It is regretted that Midshipman Cruise Training for Ensign (Medical) officers will not be conducted in fiscal year 1959 due to budgetary restrictions. Present planning included this type of training for fiscal year 1960.)

8. Upon acceptance for enrollment in the junior year of medical school, as an Ensign, you are eligible to apply for the Navy's Senior Medical Student Program.

How to Obtain Additional Information - by writing to the Chief, Bureau of Medicine and Surgery or the District Medical Officer of any continental Naval District.

How to Apply - any office of Naval Officer Procurement, Main Recruiting Station, or Naval Hospital is authorized to accept applications from qualified medical students for appointment as Ensign (Medical) U. S. Naval Reserve.

* * * * * *

Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

* * * * * *

PREVENTIVE MEDICINE SECTION

Ten Years of Health Progress in the Americas

Until a few years ago, the nations of the Americas celebrated December 2 as Pan American Health Day commemorating the creation of the Pan American Sanitary Bureau in 1902 by the First Pan American Sanitary Conference. Pan American Health Day and World Health Day are now celebrated together on the day in April chosen by the World Health Assembly for special ceremonies throughout the world.

The year 1958 is especially significant as marking the end of the first decade of the World Health Organization, the first truly global international health agency. This decade has been particularly fruitful in international health with governments collaborating through the World Health Organization, the Pan American Sanitary Organization, the Colombo Plan, INCAP, UNICEF, Technical Assistance Funds of the United Nations and the Organization of American States, and through special programs based on bilateral agreements between individual countries.

In the Americas, it is noteworthy that, since 1947, the Pan American Sanitary Organization has operated on a continent-wide basis and, since 1949, the program of the World Health Organization in the Western Hemisphere and that of the Pan American Sanitary Organization—separately financed by the nations of the Americas—have been united as a single continental program.

The most important single development in public health in the Americas during the past decade is the rapid growth of international cooperation in the solution of the health problems of the hemisphere and the constant improvement in the coordination of the activities of the several official participating agencies. This coordination has led to a change in strategy from disease control to active offense, with disease eradication as the objective for the solution of certain specific health problems. The year 1958 finds the countries of the Americas committed to no less than four eradication programs for the permanent elimination of smallpox, yaws, urban yellow fever, and malaria from the continent. A decade ago, only one of these eradication programs—that for the eradication of the Aedes aegypti mosquito that transmits yellow fever—had been approved and the means were not then available

for its execution. It is highly significant that the proposal for the eradication of yaws in Haiti, first made in 1949, has been followed by several yaws eradication programs in other parts of the world. Most significant of all is the increasing dedication of the nations of the world to the program for the eradication of the world's leading killer of a decade ago — malaria.

Eradication programs are and have been only a small part of the activity of the international health organizations. Indeed, these programs are possible only because of other international health activities supporting the development of general health programs. As success comes to the present eradication programs, it is to be expected that other diseases will be found eradicable and will be eradicated.

As the first decade of the World Health Organization ends, it is obvious that international collaboration in health has justified itself and has unlimited possibilities for the future. The countries of the Americas and of the world are learning better each year how to work together for the common good. It has long been recognized that disease knows no boundary; we are now learning that organization for health also can have no boundary. (A message from Dr. Fred L. Soper, Director, Pan American Sanitary Bureau, Regional Office of the World Health Organization, for the observance of World Health Day on 7 April 1958)

* * * * * *

World Health Day - Tenth Anniversary of WHO

The pestilences and infections that swept away past generations are losing their empire and the list of modern killers is a new one. Here are some facts and figures to illustrate how the pattern of mortal disease is changing from year to year.

The Most Significant Event of the Decade

The phenomenal decline in mortality is the most significant demographic event of the last decade according to the United Nations Demographic Yearbook. In the world as a whole, death rates for 1950-1954 (latest available) were lower than those for 1945-1949, and countries with the highest death rates in the earlier period (Africa and Asia) experienced the greatest reduction.

The decline may be attributed in the main to advances in environmental sanitation and disease control; it is reflected in increased life expectancy almost everywhere. In the more developed countries, a newborn girl can be expected to live 4-5 years longer now than 10 years ago; a newborn boy 3-4 years longer; and in some of the countries undergoing rapid development, life expectancy at birth has increased up to 11 years for girls and 10 years for boys.

With a decreasing rate of death and an almost unchanged birth rate, the population of the world (now about 2,700,000,000) is growing rapidly; every hour almost 5000 persons are added—120,000 per day or 43,000,000 per year—an increase calculated to double the world's population by the end of the century.

Pestilences That Stalk No More

The last 10 years have seen a dramatic decline in the extent and severity of the pestilential diseases whose names terrified past generations—cholera, typhus, smallpox, plague, relapsing fever, and yellow fever.

Cholera, for example, has dwindled in importance to the point of being a problem only in its epidemic foci in India and Pakistan; even there, a significant improvement has taken place; from 1945 to 1949, a total of 824,000 deaths were reported; from 1950 to 1954, less than 385,000.

Epidemic typhus is now disappearing from Europe and North America and declining in the other continents.

Smallpox is claiming fewer and fewer victims; the annual average in the whole world for the period 1945-1949 was 193,000 cases compared with 178,000 for 1950-1954.

Yellow fever shows a decline of about 50% between 1950 and 1955.

Infections Down - Accidents Up

While deaths from infectious and parasitic diseases are only half of what they were 10 years ago, accidents have become a serious and often leading cause of death—particularly among children and adolescents.

In North America and parts of Europe, accidents account for nearly one-half of all deaths among boys between 5 and 9 years of age. Road accidents claim most young lives; then come falls which in some countries are responsible for up to one-third of all accidental deaths; then drowning, fire, explosions, and poisoning.

Both Mother and Baby Are Doing Well

Fewer and fewer women die in childbirth and more and more babies survive their first step into this world.

In some countries, a 90% decrease in maternal mortality has taken place during the last 20 years. In 1955, the maternal death rate as calculated per 1000 live births was lowest in New Zealand: 0.4; 20 years ago it was 3.8. The decrease is most spectacular in the countries undergoing rapid development, for example, Ceylon, where the drop was from 20.5 in 1936-1938 to 4.1 in 1955.

As regards infant mortality, the lowest rate in the world is recorded in Sweden where it dropped from 22 per thousand live births in 1951 to 17 in 1956.

Malaria - A Monster That May Soon be Tamed

At least three-fourths of mankind live in malaria zones. Up to 1948, about 300 million people were attacked by malaria each year, and three million died. During 10 years of malaria campaigns, these figures have been cut by 30%, but the disease still presents a huge international program. However, with the insecticides and drugs that are now available, malaria eradication is possible almost throughout the world, provided that campaigns are pushed hard enough before insecticide resistance develops.

Some regions are close to the goal. In Southern Europe, 4,000,000 new cases per year were reported before the introduction of DDT spraying; now less than 10,000 per year. In the Union of Soviet Socialist Republics, there were some 4,330,000 cases of malaria immediately after World War II. In 1956, fewer than 13,000 new cases were found and no new infections are expected to occur after 1960. In the Americas, malaria once menaced 135,000,000 people. To date, 105,000,000 have been protected and the vigorous campaigns now going on are expected to complete the protection within a few years.

Even in the Eastern Mediterranean countries—a traditional reservoir of malaria—striking results have been achieved during 10 years of anti-malaria work; before, 40,000,000 people suffered regular attacks of the disease, now less than 14,000,000.

In Africa south of the Sahara, malaria presents the most serious and difficult problem with which the specialists are confronted. Nevertheless, at the end of 1955, 14,000,000 of the 116,000,000 Africans living in malarial regions had been protected against the disease.

These Are the Modern Killers

Heart disease and cancer are not only the largest causes of death in the majority of highly developed countries, but they are on the increase.

In England and Wales, for example, deaths due to cancer in 1947 accounted for 15.1% of all deaths. By 1955, the percentage had risen to 17.6. In Denmark, the increase was from 16.2 in 1947 to 21.8 in 1955, and in the United States, from 4.7 to 15.7.

In most of the highly developed countries, deaths from cancer of the respiratory system represent a growing percentage of all deaths due to cancers.

Also, deaths from degenerative disease of the heart and arteries (the most frequent cause of death in North America and most of Europe) are increasing. Among the possible causes is the aging of the population and consequent swelling in the 40-80 age group in which these diseases are most prevalent. Also, diagnostic techniques have improved, decreasing the number of deaths formerly attributed to "senility" or to "unknown causes."

Polio - New Defenses Against a New Enemy

The discovery, in 1949, of a method of growing poliomyelitis virus in tissue cultures revolutionized the study of polio and eventually resulted in large scale vaccination campaigns with the killed-virus vaccine of the Salk type.

In the United States, for example, 70 million people had been vaccinated by the end of 1956. In that year, the number of reported polio cases was the lowest since 1947; 15,400 compared to 57,879 in 1952 which was a record year for poliomyelitis. However, it has not been possible to attribute the low incidence in 1956 entirely to the vaccine.

In 1957, WHO recommended large scale trials with a new live-virus vaccine which can be given orally instead of being injected.

Tuberculosis - A Turning Point

Tuberculosis is killing relatively fewer people each year. For example, between 1950 and 1955, death rates per 100,000 population dropped from 58.1 to 31.1 in France; from 13.8 to 6.3 in Denmark; from 143.6 to 63.0 in Portugal.

Nevertheless, tuberculosis is still the greatest killer of all infectious and parasitic diseases; in North America, Europe, and Australia, it accounts for three-fourths of all deaths from these diseases occurring after the age of 15.

A considerable change in the age distribution of deaths from tuberculosis of the respiratory system has taken place. Before World War II, the majority of victims were women between 20 and 30 years of age and men between 40 and 55. Now, deaths are most numerous among people over 60, women and men alike.

In 1955, a turning point was reached in the world outlook on tuberculosis with the advent of new drugs promising a revolution in the management of the disease. Pilot studies are being sponsored by WHO to determine whether the new drugs can be used effectively in large scale home treatment of tuberculosis victims.

Greatest Vaccination Campaign

In history's campaign of immunization, 192 million people have been tested and 74 million vaccinated against tuberculosis with BCG (Bacillus Calmette-Guérin) between 1948 and 1957.

The work was started in war-torn Europe by Scandinavian relief organizations and later expanded to the other continents with the aid of WHO and UNICEF. Since 1951, the campaign has been supported by these two international bodies in close cooperation with the governments concerned. By far the largest part of the program, both with regard to the number of countries and the number of persons involved, has been carried out in Asia.

Pneumonia Steady at New Low

A substantial decrease in the number of deaths from pneumonia has taken place since penicillin and other antibiotics became available. Most lives have been saved in New Zealand, Switzerland, Italy, the Netherlands, the United States, and Sweden where the decrease in pneumonia deaths ranges from 62.1 to 53.1%. Next come Norway, Denmark, Canada, Finland, Austria, Scotland, Ireland, Germany, and Japan with a drop of 43 to 32.6%. The figures for South Africa, Northern Ireland, England and Wales, and Portugal have gone down from 26.2 to 14.1%.

Nevertheless, pneumonia still ranks among the 10 diseases causing the greatest number of deaths in the more developed countries. It remains one of the three leading causes of deaths among infants and is even more serious among the aged. Little variation in the death rate is at present being reported from one year to the next, and it can be assumed that it will remain at the present level for some years to come.

Diphtheria Capitulates

A prevalent disease at the beginning of the twentieth century, diphtheria is now in full regression throughout the world, particularly in Europe which was the continent most seriously affected. In a number of countries, among them the United Kingdom and Denmark, diphtheria has to all intents and purposes disappeared through vaccination campaigns.

In 1948, 119,000 cases were reported from the whole of Europe; currently, the annual number of cases is less than half of that. In 28 countries in Asia, America, and Europe, the number of deaths from the disease dropped from 5148 in 1950 to 2824 in 1955.

Whooping Cough Still Strikes

Although still a major cause of death of children, whooping cough is on the retreat. In 28 countries all over the world, deaths from this disease dropped from 26,325 in 1950 to 10,376 in 1955. The highest death rate is among children less than 1 year old, but it is in this age group also that the decrease is most striking: from 7874 in 1950 to 1623 in 1955. Whooping cough is unique among the diseases of childhood as it usually strikes and kills more girls than boys.

Fewer Beds - More Patients

Mental patients occupy between 40 and 50% of all the hospital beds in Europe and North America. There are not enough beds for thousands more who might benefit from hospitalization. How can this pressure be eased?

New mental treatment techniques now being applied in several countries may provide one answer. Ten years ago in Ville-Evrard, France, for example, the average stay of patients before discharge was over one year;

now it is 4 months. This hospital which in 1948 had 550 beds and admitted 100 new patients a year now has only 270 beds, but gives care to 600 new patients a year and the percentage of patients that must be kept indefinitely has gone down from 50 to 7%.

Who Is Getting Medical Care?

There are now 1,236,000 physicians serving the world's 2,700,000,000 inhabitants and the 638 medical schools operating in 85 countries graduate annually about 67,000 new doctors. Fourteen countries are fortunate enough to have one doctor to serve every thousand or fewer people; but there are 22 others where there is only one doctor for 20,000 or more inhabitants. Between these two extremes, the rest of the world shows great variations. As a general rule, there is a shortage in rural areas while cities have been known to have an over-abundance of medical practitioners. While nine countries have one medical school for less than one million of population, there are 13 countries with only one such school for 9 to 17 million people. (World Health Day, Tenth Anniversary of WHO "Ten Years of Health Progress," WHO, April 1958)

* * * * * *

Immunization of Infants with Poliomyelitis Vaccine

Recommended age limits for priority in the administration of poliomyelitis vaccine have been gradually broadened as supplies of the vaccine have increased. These "priorities" were established to protect age groups considered to be at greatest risk. Thus, the initial vaccination programs were limited to first and second graders while at present the age range has generally been extended down to 6 months and up to 40 years of age. Few specific data were available concerning the relative response of infants at various ages to poliomyelitis vaccine, however, and selection of 6 months as the lower age limit was a practical measure consistent with conservative pediatric practice and based on known immunological and epidemiologic principles.

Once the need for immunization of infants against a specific agent has been established and an effective vaccine has been developed, an optimal infant immunization schedule must be based on immunological data concerning (1) the age at which the infant is sufficiently mature to attain adequate response to the specific antigen, and (2) the degree and duration of effect (if any) of passively transferred maternal antibody on the infant's immune response. A further problem is the variation in response to a specific antigen when it is administered in combination with other antigens. Some data are already available concerning these questions in regard to poliomyelitis vaccination.

Satisfactory serologic response to poliomyelitis vaccination has been demonstrated in infants and preschool age children. These investigations included study of infants without demonstrable neutralizing antibody to any of the three types of polio virus; the response to immunization schedules started when these infants were between 2 and 6 months of age, was comparable to that attained by starting immunizations between 7 and 11 months of age. Continuing studies have provided further supporting data and have prompted a recommendation that poliomyelitis immunization may be started at 2 months of age. Also, vaccination against poliomyelitis has been found to be effective in a series of 80 infants whose immunization schedules were started as early as 6 weeks of age.

Studies are continuing to determine more specifically the effect of passively transmitted maternal antibodies on the serologic response to active immunization against poliomyelitis. Preliminary data of one study indicated that passive maternal antibodies are demonstrable for 3 to 4 months only, and continuing studies have shown the duration of passive antibodies in the infant to be a function of the mother's antibody titer at delivery. These studies also suggest that the initial response to vaccination may be less satisfactory in some young infants with high levels of passive maternal antibody.

Although some of the infants that were studied demonstrated satisfactory response to poliomyelitis vaccination in the presence of low levels of passive antibody, these initial data did not permit definitive evaluation of the effect of passive maternal antibody. However, it has been demonstrated that passive immunization with gamma globulin does not suppress response to Salk vaccine in 8 to 10-year-old boys or to live attenuated strains of poliovirus in 6 to 12-year-old children. It has been found that when infants under 6 months of age are fed living attenuated strains of poliomyelitis virus, they may develop high levels of homotypic antibodies despite the presence of passively transmitted maternal antibody. In similar studies, infants' passive maternal antibody was found to have a "half-life" of only one and one-half months and that it does not affect the satisfactory antibody response resulting from administration of live attenuated poliomyelitis viruses.

Another objective of the studies was to determine whether results would be as favorable when poliomyelitis vaccine was given in one injection mixed with diphtheria, pertussis, and tetanus antigens as when the poliomyelitis vaccine and the triple antigen were given in separate inoculations. Thus, for half of the infants in this series, poliomyelitis vaccine and triple antigen were mixed in the same syringe immediately prior to inoculation. These investigators concluded that "poliomyelitis vaccine is an effective immunizing agent when administered, according to our technique, in combination with other antigens" and that "there were no apparent hazards or adverse reactions associated with the above combinations."

These data suggest that immunization with poliomyelitis vaccine may be started in infants as young as 6 weeks of age. In discussing administration of poliomyelitis vaccine, the committee on the control of infectious diseases of the American Academy of Pediatrics states that "it seems reasonable to begin primary immunization as early as the second month of life." For production of adequate immunological response, it is essential to complete the poliomyelitis immunization series with the third inoculation following the primary injections by an interval of 6 or 7 months.

In the United States during 1956, attack rates of paralytic poliomyelitis were highest in 1-year-old children and the largest proportion of cases occurred in the age group under 5 years. Preliminary data for 1957 indicate that a comparably high proportion of paralytic cases are occurring in preschool age children. The importance of early immunization against poliomyelitis is becoming increasingly evident. (Guest Editorial: Thrupp, L. D., Immunization of Infants with Poliomyelitis Vaccine: J. A. M. A., 166:160-161, January 11, 1958)

* * * * * *

Accidental Drownings

Each year, the vacation season brings reports of accidental drownings. Most of these deaths are the result of carelessness or "taking chances." Aquatic sports provide healthy exercise, but participants should observe certain rules for their own safety.

Wait for at least one hour after eating before going into the water.
Do not go into the water when overtired or overheated.
Know the water before diving; know that it is deep enough and that there are no submerged rocks or logs.
Do not try long swims without an accompanying boat.
Swim parallel to the shore.
Do not swim alone or at night.
Do not become panicky. If you get cramps, try to knead them out with your hands. If caught in an undertow, go with it and come to the surface as soon as possible. Float when you become tired in water over your head.
If you do not swim, do not enter water of more than waist depth and know the condition of the bottom so you can avoid holes.
Do not stand or change seats in small boats or canoes.
Do not attempt a rescue if you do not swim or if you swim poorly.
Know how to give first aid and artificial respiration.

(Accidental Drownings, Morbidity Report, Bureau of Communicable Disease Control, Commonwealth of Virginia, Department of Health, July 6, 1957)

U. S. GOVERNMENT PRINTING OFFICE : 1958 O - 441841

Note: The foregoing safety rules are published early in the season so that they may serve as a basis for similar articles in local information bulletins of station newspapers.

* * * * * *

Policy

The U. S. Navy Medical News Letter, is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

* * * * * *

The printing of this publication was approved by the Director of the Bureau of the Budget, 16 May 1955.

* * * * * *

DEPARTMENT OF THE NAVY
U. S. NAVAL MEDICAL SCHOOL
NATIONAL NAVAL MEDICAL CENTER
BETHESDA 14, MARYLAND
OFFICIAL BUSINESS
Permit No. 1048

POSTAGE AND FEES PAID
NAVY DEPARTMENT